REMARKS

Status of Claims:

Claims 1-19 are present for examination.

Interview with Examiner:

Applicant expresses appreciation to the Examiner for the courtesy of the interview on June 8, 2005, in which the Examiner indicated that, with respect to the arguments that the combination of Shiragaki and Manchester would not function, the Examiner no longer considers the arguments to be "attorney arguments", but that the Examiner has now entered and considered the arguments.

The Examiner also presented the suggestion of adding a limitation upon RCE to the independent claims similar to "upon switching synchronization is maintained between the scramblers and the descramblers". The Examiner stated that adding such a limitation "would overcome the combination of Manchester and Shiragaki".

Obviousness Rejections:

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiragaki (U.S. Patent Number 5,663,820), and further in view of Manchester et al. ("IP over SONET") (hereinafter Manchester).

Claims 2-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Shiragaki and Manchester.

With respect to claims 1-19, as amended, the rejections are respectfully traversed.

Independent claim 1, as amended, recites a scramble control method for a switching system, said switching system comprising:

> a switch having input ports and output ports, said switch operative for switchably interconnecting said input ports with said output ports;

a plurality of input interfaces each connected to a corresponding input port of the switch, each of the input interfaces including a scrambler, each scrambler having a pseudorandom pattern generator, wherein each of the input interfaces inputs data to sequentially output frames including scrambled data to the corresponding input port of the switch; and

a plurality of output interfaces each connected to a corresponding output port of the switch, each of the output interfaces including a descrambler, each descrambler having a pseudorandom pattern generator, wherein each of the output interfaces inputs frames including scrambled data from the corresponding output port of the switch to output frames of original data, and wherein each of the pseudorandom pattern generators of the scramblers and the descramblers generates a same pseudorandom pattern when initialized with a same input value,

said scramble control method comprising the steps of:

"resetting the scramblers simultaneously to initialize the pseudorandom pattern generators of the scramblers with the same input value, so as to synchronize the scramblers;

resetting the descramblers simultaneously to initialize the pseudorandom pattern generators of the descramblers with the same input value, so as to synchronize the descramblers and to establish synchronization between the scramblers and the descramblers; and

maintaining synchronization between the scramblers and the descramblers after the switch performs a switching operation." (Emphasis Added)

A scramble control method including the above-quoted features has the advantage that scramblers of input interfaces that are connected to input ports of a switch are reset simultaneously to initialize pseudorandom pattern generators of the scramblers with **a same input value**, so as to synchronize the scramblers. Also, descramblers of output interfaces that are connected to output ports of the switch are reset simultaneously to initialize pseudorandom pattern generators of the descramblers with **the same input value**, so as to synchronize the descramblers. In addition, each of the pseudorandom pattern generators of the scramblers and the descramblers generates a same pseudorandom pattern when initialized with the same input value. Moreover, synchronization between the scramblers and the descramblers is **maintained** after the switch performs a switching operation. Thus, it is possible to operate all the scramblers and descramblers such that, even if **switching** is

performed per frame of data, the synchronization between the scramblers and the descramblers is **maintained**. (Substitute Specification; page 9, lines 13-17; page 20, lines 9-16; page 24, lines 1-5; page 25, lines 7-11).

Neither Shiragaki nor Manchester, alone or in combination, disclose or suggest a scramble control method including the above-quoted features. The Examiner stated that, "Shiragaki disclosed an optical switch with multiple input and output interfaces ... but Shiragaki failed to disclose a scrambler and a descrambler at each input and output interface." The Examiner then pointed to Manchester as disclosing a pseudo-random self-synchronizing scrambler and descrambler, and stated that, "it would have been obvious to the ordinary person skilled in the art at the time of invention to employ the teachings of Manchester to the invention of Shiragaki by placing self-synchronizing scramblers at the inputs and outputs of the switch of Shiragaki."

However, if scramblers such as those disclosed in Manchester were connected to the inputs of the switch in Shriagaki, the scramblers would **not** be initialized with a **same** input value. Indeed, Manchester explicitly states that an initial seed for a scrambler is **unspecified** and that, consequently, the first 43 transmitted bits following startup or reframe operation will **not** be descrambled correctly. (Manchester; page 139, right column, first paragraph). A value in the 43-bit shift register of the scrambler of Manchester depends on the input data to the scrambler. (Manchester; Figure 4). If scramblers such as those disclosed in Manchester were connected to the switch of Shiragaki, each scrambler would receive **different** input data and, as a result, the scramblers would not be initialized with a **same** input value. A similar argument also applies with respect to the descramblers of Manchester.

Furthermore, even if the scramblers and descramblers of Manchester were employed with the switch of Shriagaki, the resulting device would not allow for **maintaining** synchronization between the scramblers and the descramblers **after** the switch performs a switching operation. The values in the 43-bit shift registers of the scramblers and descramblers in Manchester depend on the previously transmitted 43 bits. (Manchester; Figure 4). If the switch of Shiragaki performs a switching operation, and a scrambler of Manchester begins transmitting scrambled data to a descrambler to which it was not

previously transmitting data, then the value in the 43-bit shift register of the scrambler would be **different** from the value in the 43-bit shift register of the descrambler. (Manchester; Figure 4). As a result, such a scrambler and descrambler would **not** be synchronized after the switching operation, and the transmitted data would be descrambled incorrectly.

In applicant's specification, applicant explains why the scrambler of Manchester cannot be applied directly to an optical switching system. (Substitute Specification; page 7, line 25 to page 9, line 7). Applicant describes the system of Manchester and then states: "However, this system cannot be applied directly to an optical switching system." (Substitute Specification; page 8, lines 14-15) (Emphasis Added). Applicant explains that the synchronizing system of Manchester is devised for a one-to-one transmission device. (Substitute Specification; page 9, lines 4-7). Furthermore, applicant explains that the scrambler in Manchester is a self-synchronizing scrambler in which the internal state of the scrambler varies with bit strings of the past. (Substitute Specification; page 8, lines 15-18) (see also Manchester; page 139).

The system of Manchester works in a one-to-one configuration between one scrambler and one descrambler because both the scrambler and the descrambler can maintain synchronization based on bit strings of the past. However, as applicant explains, in an optical switching system, a transmission source of a frame received by an output interface varies every time the optical switch performs switching. (Substitute Specification; page 8, lines 18-20). As a result, synchronization between a scrambler and a descrambler is lost when switching is performed, because a different scrambler may be transmitting data to the descrambler after switching is performed, but the new different scrambler would not be synchronized with the descrambler because the new different scrambler would not know the bit strings of the past. (Substitute Specification; page 8, lines 21-22).

Indeed, applicant expressly states that, "[t]his is a problem peculiar to a switching system, and this problem cannot be solved by synchronizing systems devised for a one-to-one transmission device including the above-mentioned system devised by Manchester et al." (Substitute Specification; page 9, lines 4-7) (Emphasis Added). Moreover, the teachings of

Shiragaki do not address the problem because, as recognized by the Examiner, "Shiragaki failed to disclose a scrambler and descrambler".

Therefore, independent claim 1, as amended, is neither disclosed nor suggested by the cited prior art and, hence, is believed to be allowable.

Independent claim 11, as amended, recites a scramble control method with the feature that each descrambler can be synchronized with a corresponding scrambler after a switch performs a switching operation. Therefore, independent claim 11 is believed to be allowable for at least the same reasons indicated above with regard to claim 1 concerning the argument that neither Shiragaki nor Manchester disclose or suggest synchronization between a scrambler and a descrambler after a switch performs a switching operation.

Independent claim 16, as amended, recites a switching system with similar features as features of a scramble control method of independent claim 1. Therefore, independent claim 16 is believed to be allowable for at least the same reasons that independent claim 1 is believed to be allowable.

Independent claim 18, as amended, recites a switching system with similar features as features of a scramble control method of independent claim 1. Therefore, independent claim 18 is believed to be allowable for at least the same reasons that independent claim 1 is believed to be allowable.

Independent claim 19, as amended, recites a switching system with similar features as features of a scramble control method of independent claim 11. Therefore, independent claim 19 is believed to be allowable for at least the same reasons that independent claim 11 is believed to be allowable.

The dependent claims are deemed allowable for at least the same reasons indicated above with regard to the independent claims from which they depend.

Conclusion:

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741.

If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date July 11, 2005

By Just Sobaje

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (310) 975-7965
Facsimile: (310) 557-8475

Justin M. Sobaje
Attorney for Applicant
Registration No. 56,252